(C) identifying a fragment bound by the labeled protein by detecting the label, thereby detecting a nucleic acid and/or PNA fragments having a mutation..

2. (Amended) The method of claim 1, wherein the protein specifically binding to a mismatched base pair is a mismatch binding protein.

4. (Twice Amended) The method of claim 1, wherein the protein specifically binding to a mismatched base pair is labeled with at least one kind of protein selected from the group consisting of luminescent proteins, phosphorescent proteins, fluorescent proteins, radioactive proteins, stable isotopes, antibodies, antigens, and enzymes.

5. (Twice Amended) The method of claim 1, wherein the protein specifically binding to a mismatched base pair is labeled with GFP (Green Fluorescence Protein).

7. (Amended) The method of claim 6, wherein the label introduced into the nucleic acid and/or PNA fragment to be assayed for mutations produce a signal different from that produced by the label attached to the protein specifically binding to the mismatched base pair, and quantification and identification of the fragment having a mismatched base pair are simultaneously performed.

8. (Three times Amended) The method of claim 6, wherein the nucleic acid and/or PNA to be assayed for mutations is labeled with at least one kind of label selected from the group consisting of luminescent proteins, fluorescent proteins, phosphorescent proteins, stable isotopes, radioactive proteins, antibodies, antigens, and enzymes.

9. (Twice Amended) A method for detecting a nucleic acid fragment and/or PNA fragment having a mutation, comprising the steps of:

(A) hybridizing at least one fragment among one or more fragments fixed on a substrate, which fragments are selected from the group consisting of one or more nucleic acid fragments and one or more PNA fragments and have all of a sequence of full-length gene, with at least one fragment of which mutation is to be assayed, wherein said

fragment is selected from the group consisting of one or more nucleic acid fragments and one or more PNA fragments;

(D) treating a mismatched base pair occurring between the hybridized fragments with a protein specifically recognizing and cleaving the mismatched base pair to cut the hybridized fragments at the mismatched base pair, or to remove at least a part of one strand of the fragments hybridized from the mismatched base pair;

(E) labeling a fragment remained on the substrate after the cleavage or removal; and

(F) identifying the labeled fragment by detecting the label, thereby detecting a nucleic acid and/or PNA fragment having a mutation.

11. (Twice Amended) The method of claim 9, wherein the protein specifically recognizing and cleaving the mismatched base pair is a nuclease.

15. (Three times Amended) The method of claim 13, wherein the fragment is labeled with at least one kind of label selected from the group consisting of luminescent proteins, fluorescent proteins, phosphorescent proteins, stable isotopes, radioactive proteins, antibodies, antigens, and enzymes.

18. (Three times Amended) The method of claim 16, wherein the nucleic acid and/or PNA to be assayed for mutations is labeled with at least one kind of label selected from the group consisting of luminescent proteins, fluorescent proteins, phosphorescent proteins, stable isotopes, radioactive substances, antibodies, antigens, and enzymes.

23. (Twice Amended) A protein specifically bindable to a mismatched base pair wherein said protein is labeled with GFP (Green Fluorescence protein).

24. (Twice Amended) The protein of claim 23, wherein the protein specifically bindable to the a mismatched base pair is a C/C mismatch binding protein.

25. (Twice Amended) A protein specifically bindable to a mismatched base pair, wherein said protein is a C/C mismatch binding protein.

27 (Three times Amended) The protein of claim 25, wherein the label is at least one kind of label selected from the group consisting of luminescent proteins, phosphorescent proteins, fluorescent proteins, stable isotopes, radioactive proteins, antibodies, antigens, and enzymes.

32. (Amended) A method for detecting nucleic acid and/or PNA having a mutation, comprising the steps of:

(A) providing

- at least one polynucleotide fixed on a substrate, wherein said polynucleotide has all of the sequence of full-length gene;
- a sample comprising at least one fragment of which mutation is to be assayed, wherein said fragment is selected from the group consisting of one or more nucleic acid fragments and one or more PNA fragments; and
- a labeled protein, wherein said protein specifically binds to a mismatched base pair resulting from hybridization between a polynucleotide and a fragment comprising a mutation;

(B) hybridizing said fragment to said polynucleotide;

(C) introducing said labeled protein under conditions that permit said protein to specifically bind to any mismatched base pairs that are present; and

(D) identifying a fragment bound by the labeled protein by detecting the label, thereby detecting a nucleic acid and/or PNA fragments having a mutation.

33. (Amended) A method for detecting a nucleic acid fragment and/or PNA fragment having a mutation, comprising the steps of:

(A) providing

- at least one polynucleotide fixed on a substrate, wherein said polynucleotide has all of the sequence of full-length gene; and
- a sample comprising at least one fragment of which mutation is to be assayed wherein said fragment is selected from the group consisting of one or more nucleic acid fragments and one or more PNA fragments;

(B) hybridizing said fragment to said polynucleotide;

(C) treating a mismatched base pair occurring between said hybridized fragment and said polynucleotide with a protein that specifically recognizes and cleaves a mismatched base pair to cut the hybridized nucleic acids at the mismatched base pair, or to remove at least a part of one strand of the nucleic acids hybridized from the mismatched base pair;

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(D) labeling a polynucleotide remained on the substrate after the cleavage or removal; and

(F) identifying the labeled polynucleotide by detecting the label, thereby detecting a nucleic acid and/or PNA fragment having a mutation.